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Studies in Malesian *Vitaceae* XI. *Pterisanthes* in Borneo, with additional notes on *P. grandis* and *P. hirtiflora*

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Summary. The Bornean species of *Pterisanthes* are enumerated, and a key to the ten species documented is provided. *P. grandis* Ridl. is newly recorded for Sabah and Brunei, and a description of the species is given; likewise, *P. hirtiflora* Ridl. is newly recorded for Kalimantan.

The genus *Pterisanthes* Blume is one of the most interesting genera of Vitaceae in Malesia. It is characterized by a peculiar type of inflorescence consisting of a leaf-opposed panicle of lamellae. The inflorescence main axis or rachis is fleshy and on both its sides there are flat lamellae of various shapes and sizes, sometimes oriented in three planes, two horizontal and one vertical. On the fleshy surface of the lamellae occurs many partially immersed tiny hermaphrodite flowers arranged in linear pattern (except in *P. hirtiflora* in which these flowers are not immersed but still sessile) and in some species, on the margin of the lamellae occurs pedicellate flowers which are either male or neuter. A discussion on the structure and putative evolution of this unique inflorescence has been given by Steenis & Bakhuizen van den Brink (1967) and Latiff (1994). In the Vitaceae, this genus is relatively small, with only 20 species (Latiff 1982, 1996).

Apparently Borneo is the centre of diversity of the genus with a total of ten species occurring, four of which are endemic. Four species, viz. *P. polita, P. cissoides, P. grandis* and *P. quinquefoliolata* occur in Sabah, the last endemic to Sabah and Brunei; eight species, viz. *P. cissoides, P. eriopoda, P. grandis, P. hirtiflora, P. polita, P. beccariana, P. rufula* and *P. linguispicata* occur in Sarawak, where the last is endemic. *P. grandis, P. cissoides, P. polita* and *P. rufula* also occur in Brunei and *P. polita, P. rufula, P. cordigera* and *P. hirtiflora* are known to occur in Kalimantan, Indonesia. Kalimantan may be undercollected with regards to the Vitaceae, and in particular the genus *Pterisanthes*.

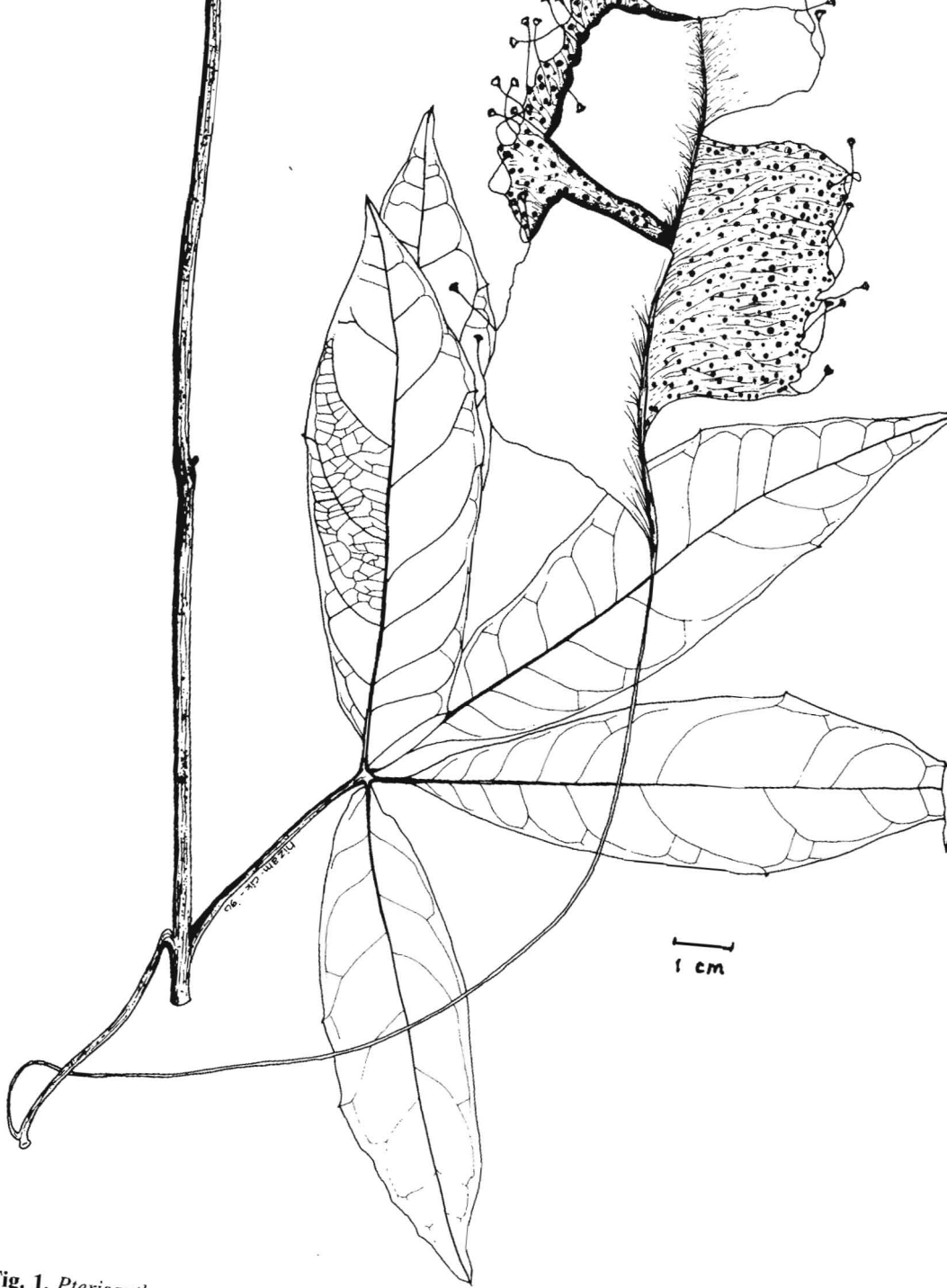
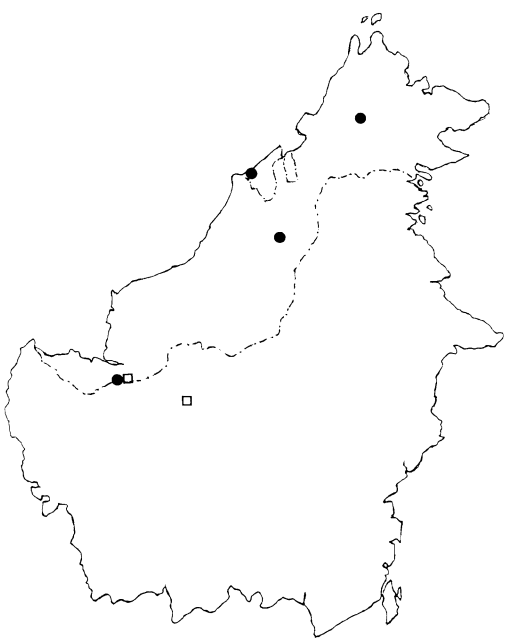


Fig. 1. *Pterisanthes grandis* Ridley, habit; note the size of the inflorescence (*K. Mat-Salleh & Wan A. Latiff* KMS 1972).

PTERISANTHES GRANDIS RECORDED FOR SABAH AND BRUNEI

P. grandis, which has the largest inflorescence in the genus, was first described by Ridley (1931) based on specimens collected by Haviland (Nos. 891 and 1852) in August 1892 from the vicinity of Kuching, Sarawak. The locality is likely to be Mt. Penrissen, a hillock near Kuching. The first collection cited by Ridley (*l.c.*), *Haviland* 891, belongs to the more widely distributed species *P. cissoides*, and the second, *Haviland* 1852, represents *P. grandis* and was thus designated the lectotype of that species (Latiff 1982). *P. grandis* is, as indicated by its specific epithet, unique in its extraordinarily large inflorescence, which resembles a miniature rayfish (Fig. 1). The leaves are coriaceous, unlike those in most species, which are generally chartaceous and the stems are comparatively thicker.

The species was subsequently collected in the Baram area (*Hewitt*, undated, "sublimated in 1907") and has never been collected again until 1977, some 85 years later, when the third specimen was collected in the Long Sebala area, Baram, Sarawak by Dr S.C. Chin (KLU). A fourth specimen was collected in the vicinity of Sungai Kinazou in Keningau, Sabah by one of us (K.M-S.) and a student. Two years later, another specimen surfaced from Belait, Brunei, collected by Dr John Dransfield (K). The latter two collections are considered interesting because they were collected outside Sarawak and far from the type locality, Kuching, thus extending its distribution to both Brunei and Sabah (Fig. 2). With these additional collections available, a better diagnosis of the morphology of this highly interesting species is now possible (see description under the enumeration of species, given later).



PTERISANTHES HIRTIFLORA RECORDED FOR KALIMANTAN

P. hirtiflora, the only species in the genus with sessile and hairy lamellate flowers, was also first described by Ridley (1931) based on a specimen collected by Haviland in the vicinity of Kuching, Sarawak, probably also on Mt. Penrissen. The species has not been collected again until 1993, 101 years later, in the Bukit Baka area, Sintang, Kalimantan. The range of distribution is thus extended to south-west Kalimantan (Fig. 2). As both specimens do not differ very much, no new description is provided here.

Fig. 2. Distribution of *Pterisanthes grandis* (•) and *P. hirtiflora* (□) in Borneo.

NOTES ON THE GENUS *PTERISANTHES* IN BORNEO

Notes follow the key to all ten species known for Borneo, given below. For descriptions, other than of *P. grandis* and *P. beccariana*, see Latiff (1982).

KEY TO *PTERISANTHES* SPECIES IN BORNEO

1a. Inflorescence with pedicellate flowers on the margin of the lamellae.
- 2a. Leaves simple ..... **8. *P. polita***
- 2b. Leaves compound.
  - 3a. Upper surface of the leaves covered with stiff simple hairs, the lower surface heterotrichous; lamellate flowers sessile, hairy ..... **6. *P. hirtiflora***
  - 3b. Upper surface of the leaves glabrous, lower surface glabrous or becoming glabrous; lamellate flowers partially immersed, glabrous.
    - 4a. Leaves mostly 5-foliolate, rarely 3-foliolate, glabrous, coriaceous, with entire margin; lamella *c.* 12 cm wide; stem *c.* 8 mm in diameter ..... **5. *P. grandis***
    - 4b. Leaves 3-foliolate, becoming glabrous, chartaceous, with sinuate margin; lamella 2.7-8 cm wide; stem *c.* 4 mm in diameter ..... **2. *P. cissoides***

1b. Inflorescence without pedicellate flowers on the margin of the lamellae.
- 5a. Leaves simple.
  - 6a. Leaves ovate; lower surface glabrous ..... **1. *P. beccariana***
  - 6b. Leaves ovate-oblong; lower surface (especially at the margin) tomentose ..... **4. *P. eriopoda***
- 5b. Leaves mostly compound, sometimes basal leaves simple.
  - 7a. Leaves 5-foliolate, digitate, rarely 3-foliolate.
    - 8a. Lamella very narrow *c.* 2 mm wide; leaves 5-foliolate, glabrous. ..... **7. *P. linguispicata***
    - 8b. Lamella wider, *c.* 10 mm wide; leaves 3-6-foliolate (mostly 5-foliolate), glabrous or becoming glabrous ... **9. *P. quinquefoliolata***
  - 7b. Leaves mostly 3-foliolate, basal leaves very rarely simple
    - 9a. Inflorescence interrupted by a portion of unlamellated axis; leaflets with rounded apices; sometimes basal leaves simple .... **3. *P. cordigera***
    - 9b. Inflorescence lamella continuous; leaflets with gradually acuminate apices; without simple basal leaves ..... **10. *P. rufula***

1. *P. beccariana* (Miq.) Planchon in DC., Monog. Phan. 5 (1887) 417; Ridley, Fl. Mal. Penin. 1 (1922) 481; Suessenguth in Engler & Prantl, Natur. Pflanzenfam. 20d (1953) 317;

Backer & Bakhuizen van den Brink, Fl. Java 2 (1965) 88; Latiff, Fedn. Mus. J. n.s. 27 (1982) 57.

Scandent vine; climbing by filiform tendrils. Stem smooth, relatively thin, *c.* 0.1 cm diameter, hollow, striate. Leaves simple, coriaceous, glabrous on both surfaces, the petiole 0.9–2.4 cm long; ovate to ovate-oblong, 7.3–12.4 × 5.4–9.2 cm, apex acuminate, base semicordate, margin entire, the veins *c.* 5 pairs, the midrib slightly sunken above, elevated below, the lateral veins very prominent below, looping near the margin, reticulations prominent. Peduncle *c.* 1.7 cm long; primary branch of inflorescence filiform, *c.* 1.6 cm long; lamellae 8.6–13.2 × 2.3–3.1 cm, oblong. Berries *c.* 0.8 cm in diameter, globose to obovoid, drying stone-hard, usually 2-seeded. Seeds 0.7 × 0.6 cm, obovate in outline, the chalazal knot clavate, the testa smooth, the endosperm T-shaped in cross-section.

DISTRIBUTION. Borneo (Sarawak and Sabah) and Malay Peninsula.

SPECIMENS EXAMINED—SARAWAK: s. loc., *Beccari* PB 796 (type K), *Haviland* 892 (K); Baram, *Hewitt* s.n. (L). **SABAH:** Mt. Kinabalu, Poring, *C.T. Lau* 39 (UKMS).

This species is only represented by three collections from Sarawak, one from Sabah and two from the Malay Peninsula (*Wray* 3015, *Maingay* 2707 (K)). Previously, it was considered conspecific with *P. eriopoda* (Miq.) Planchon (Latiff 1982), but with more detailed study it has proven to be a good species, differing from *P. eriopoda* in its ovate and glabrous leaves and in the wider lamellae of the inflorescence. Lau's collection from Mt. Kinabalu is the first record for Sabah.

2. *P. cissoides* Blume, Bijdr. 1 (1825) 192; Miquel, Linn. 18 (1844) 395; Lawson in Hooker f., Fl. Brit. Ind. 1 (1875) 664; Planchon in DC., Monog. Phan. 5 (1887) 421; King, J. As. Soc. Beng. 65,2 (1896) 408; Ridley, Fl. Mal. Penin. 1 (1922) 482; Suessenguth in Engler & Prantl, Natur. Pflanzenfam. 20d (1953) 318; Backer & Bakhuizen van den Brink, Fl. Java 2 (1965) 88; Latiff, Fedn. Mus. J. n.s. 27 (1982) 48.

P. trifoliolata Merr., Univ. Calif. Publ. Bot. 15 (1929) 185.

DISTRIBUTION. Throughout Borneo, Java, Sumatra and the Malay Peninsula.

SPECIMEN EXAMINED—BRUNEI: Tutong, Rambai, *Coode* 6357 (K); Temburong, Amo, *Wong* 1349 (K). **KALIMANTAN:** s. loc., *Jaheri* 1461 (BO), *Endert* 1846 (L), *Endert* 5130 (L), *Lowe* s.n. (K), *Korthals* s.n. (L); G. Samenggaris, *Amdjah* 1050 (L, BO); Gunung Raya, *Kessler* 603 (K, L), *Kessler* 5959 (L), *Kessler et al.* 552 (L), *Kostermans* 4277 (L) (inflorescence only), *Leighton* 1014 (L); Balikpapan, *Mogea* 3779 (L); Pontianak, *Prawiroatmojo* 275 (K, L), *Balgooy* 6107 (L); Winariset, *van Balgooy & Kessler* 5959 (L). **SABAH:** Beaufort, Bk. Montinior, *Dewol & Karim* SAN 80281 (SAN); Kota Marudu,

Marak-marak, *Amin & Mansus* SAN 119026 (SAN); Beluran, Sg. Tahid, *Amin et al.* SAN 67344 (K, SAN), Telupid, *A. Rahim et al.* SAN 93296 (K, L, SAN), Bidu-bidu FR, *Kokawa & Hotta* 1434 (L), *Maikin et al.* SAN 130676 (SAN); Mt. Kinabalu, Dallas, *J. & M. S. Clemens* 26042 (BM, K, L), 30317 (K, L); Kiau, *M. S. Clemens* 9975 (K); Kiau, *Gibbs* 3994 (BM), *Elmer* 20829 (K, type of *P. trifoliolata*); Ranau, Kg. Nawanon, *Sigin et al.* SAN 109715 (SAN), Nosurong, *Amin et al.* SAN 123245 (SAN), Belingkadas hill, *Amin et al.* SAN 114144 (SAN), Ru Gading, *Amin & Francis* SAN 116034 (SAN); Kalabakan, Hap Seng, *Fedilis* SAN 94804 (K, L, SAN); Sandakan, Sepilok, *Stone* 6746 (KLU, L), Sepilok FR, *Petrus* SAN 132260 (SAN), Paitan FR, *Ampuria* SAN 32792 (SAN); Lahad Datu, Kennedy bay, *Leopold Madani* SAN 130692 (K, SAN), *Muin Chai* SAN 26101 (K, SAN), Ulu Sg. Segama, *Argent et al.* SAN 108300 (SAN), P. Sakar, *Muin Chai* SAN 21647 (SAN), Danum Valley, *Wong* KM-DV 2 (SAN), Segama Dam, *Muin Chai* SAN 31672 (SAN); Kinabatangan, Sg. Menanggul, *Amin et al.* SAN 197805 (SAN); Tawau, Tawau hills, *Leopold Madani & Sigin* SAN 111181 (SAN). **SARAWAK:** Kuching, *Haviland* 891 (K), *Native Coll.* 1079 (BM), *Busang, Geh & Samsuri* 725 (SING); Bario, Batu Lawi, *Dayang Awa & Bernard Lee* S. 50950 (K, SAR).

This widely distributed species is recognized by its large pendent inflorescences, which are, however, still smaller than those of *P. grandis*. Several specimens from Sabah (e.g., *J. & M.S. Clemens* 26642) have narrower lanceolate leaflets with almost entire margin, which Korthals in his unpublished manuscript referred to as *P. coriacea* var. *borneensis*. Observations made on all specimens from the entire range of the species does not justify any recognition of infraspecific taxa. Coode's collection is the first record for Brunei.

3. *P. cordigera* (Griff.) Planchon in DC., Monog. Phan. 5 (1887) 420; Suessenguth in Engler & Prantl, Natur. Pflanzenfam. 20d (1953) 318; Latiff, Fedn. Mus. J. n.s. 27 (1982) 61.

DISTRIBUTION. Borneo (Kalimantan), Sumatra and the Malay Peninsula.

SPECIMEN EXAMINED—KALIMANTAN: Mt. Maranga, *Kostermans* 12576 (L).

This species is represented in Borneo by a single specimen from Kalimantan. It may also be present in Sabah and Sarawak. It is similar to *P. rufula* but differs in the interrupted lamella of the inflorescence and obovate terminal leaflets.

4. *P. eriopoda* (Miq.) Planch. in DC., Monog, Phan. 5 (1887) 417; Ridley, Fl. Mal. Penin. 1 (1922) 481; Suessenguth in Engler & Prantl, Natur. Pflanzenfam. 20d (1953) 317; Backer & Bakhuizen van den Brink, Fl. Java 2 (1965) 88; Latiff, Fedn. Mus. J. n.s. 27 (1982) 57.

DISTRIBUTION. Sarawak.

SPECIMEN EXAMINED—SARAWAK: Simanggang, *Anderson* 10013 (SAR).

5. *P. grandis* Ridley, Kew Bull. (1913) 496; Suessenguth in Engler & Prantl, Natur. Pflanzenfam. 20d (1953) 317; Latiff, Fedn. Mus. J. n.s. 27 (1982) 50.

Scandent vine; climbing by filiform tendrils. Stem smooth, relatively thick, 0.6–1.1 cm in diameter, hollow, striate. Leaves rarely 3- to mostly 5-foliolate, digitate, coriaceous, glabrous on both surfaces, the petiole 5.9–10.4 cm long; terminal leaflets lanceolate to elliptical, 17.3–25.4 × 6.1–10.2 cm, apex acuminate, base acute, margin entire, the veins *c.* 12 pairs, the midrib slightly sunken above, elevated below, the lateral veins very prominent below, looping near the margin, reticulations prominent, the petiolules *c.* 2.3 cm long; lateral leaflets lanceolate to elliptic, 14.1–17.4 × 5.1–6.3 cm, base somewhat oblique, the apex and margin as in terminal leaflets, the petiolules *c.* 0.6 cm long. Peduncle *c.* 11 cm long; primary axis of inflorescence filiform, *c.* 36 cm long; lamellae *c.* 10 × 12 cm, rectangular, rayfish-like. Pedicellate flowers on the margin of lamellae, few, the pedicels *c.* 2.8 cm long. Berries *c.* 0.8 cm in diameter, globose to obovoid, drying stone-hard, usually 2-seeded. Seeds 0.7 × 0.6 cm, obovate in outline, the chalazal knot clavate, the testa smooth, the endosperm T-shaped in cross-section.

(Fig. 1)

DISTRIBUTION. Sarawak, Brunei and Sabah.

SPECIMENS EXAMINED—SARAWAK: Kuching, *Haviland* 891 (SAR), 1852 (lectotype K); Baram, s. loc., *Hewitt* s.n. (BO); Baram, Long Sebala, *S.C. Chin* 2667 (KLU, SAR). **SABAH:** Keningau, Sook, Kg. Lembaga, *K. Mat-Salleh & Wan A. Latiff* KMS 1972, (UKMB); Tenom, Sg. Punti, *Fedilis* SAN 120311 (SAN). **BRUNEI:** Belait, Labi, *J. Dransfield et al.* JD 6556 (K, SAN).

The specimens from Baram (Sarawak), Brunei and Sabah have relatively smaller leaflets compared to those of the lectotype. Obviously, more specimens are required to properly understand this variation in leaf morphology. In general appearance, the species is similar to *P. cissoides*, especially specimens with 3-foliolate leaves, but differs in its larger, generally digitate (5-foliolate) and coriaceous leaflets, thicker and smooth stem and comparatively larger inflorescence. The inflorescence is the largest in the genus and the stems the thickest.

6. *P. hirtiflora* Ridley, Kew Bull. (1913) 497; Suessenguth in Engler & Prantl, Natur. Pflanzenfam. 20d (1953) 318; Latiff, Fedn. Mus. J. n.s. 27 (1982) 50.

DISTRIBUTION. Sarawak and Kalimantan.

SPECIMENS EXAMINED—SARAWAK: Kuching, Haviland 2288 (K). **KALIMANTAN:** Sintang, Bukit Baka Nature Park, *A.C. Church et al.* 167 (BO).

This species is very interesting in that it is the only one whose lamellate flowers are more

or less globular, hairy (thus *hirtiflora*) and sessile, unlike those in other species of the genus which are glabrous and partially immersed in the fleshy axis. More collections are needed to understand its distribution and infraspecific variation.

7. *P. linguispicata* Steenis, Bot. Jahrb. 86 (1967) 388; Latiff, Fedn. Mus. J. n.s. 27 (1982) 62.

DISTRIBUTION. Known only from its type specimen from Sarawak.

SPECIMEN EXAMINED—SARAWAK: Serian, Sg. Sabal Tapang, *Ilias Paie* S. 16967 (holotype L; isotypes K, SAN).

Generally it is very similar to *P. quinquefoliolata* but differs in its glabrous leaflets and extremely narrow inflorescence, which resembles a spike. More collections are needed to ascertain its distinction from that species.

8. *P. polita* (Miq.) Lawson in Hooker f., Fl. Brit. Ind. 1 (1875) 663; Planchon in DC., Monog. Phan. 5 (1887) 416; Craib, Fl. Siam. Enum. 1 (1926) 315; Suessenguth in Engler & Prantl, Natur. Pflanzenfam. 20d (1953) 316; Latiff, Fedn. Mus. J. n.s. 27 (1982) 53.

P. parvifolia Merrill, J. As. Soc. Str. Br. 86 (1917) 95.

P. gladiata Steenis, Bot. Jahrb. 86 (1967) 388.

DISTRIBUTION. Sumatra, Malay Peninsula. Lower Burma, Peninsular Thailand and throughout Borneo.

SPECIMENS EXAMINED—BRUNEI: Belait, Rambai, *Coode et al.* 6352 (K), Labi Hill FR., *Coode et al.* 6812 (K), Labi, *Coode et al.* 6934 (K), *Dransfield et al.* 7256 (K), *Simpson & Marsh* 2124 (K), Labi Road, km. 13, *Wong* WKM 701 (K), *Kirkup et al.* 200 (K, SAN), 239 (K), Bukit Sawat, *Niga* NN 250 (K); Berakas, *Ashton* BRUN 5430 (L); Tutong, Ladan hills, *Coode et al.* 7330 (K); Temburong, Amo. *Argent & Mitchell* 91201 (K), Batu Apoi, *Dransfield et al.* 6911 (K), Sg. Temburong, *Wong* WKM 1230 (K, SAN); s. loc., *van Neil* 4267 (L). **KALIMANTAN:** s. loc., *Jaheri* 680 (BO, L), *Elsener* 224 (L), 232 (L); Pontianak, *Burley et al.* 838 (L); Gunung Raya, *Mogea* 4404 (BO, L); Gunung Raya, *Veldkamp* 8084 (L); *Wiriadinata* 563 (BO, K, L); Balikpapan, *Sauveur* K 4 (BO, K, L); Winariset, *Ridsdale* PBU 480 (BO). **SABAH:** Weston, Sianggau FR., *Ag. Amin* SAN 132112 (SAN); Beaufort, Kg. Inuman, *Mikil* SAN 30196 (SAN); Papar, Bongawan rd., *Aban Gibot* SAN 66734 (SAN); Sipitang, Kg. Maligan, *Aban Gibot* SAN 72904 (SAN), Kuala Mengalong FR, *Ag. Amin* SAN 106036 (SAN), Mesapol FR., *Leopold Madani & Ismail* SAN 111447 (SAN); Nabawan, *Argent & Lamb* s.n. (SAN), Sg. Millian, *Sumbing*

SAN 118722 (SAN), km. 55, *Sumbing* SAN 128411 (SAN), Sg. Siburan, *Dewol & Lideh* SAN 105598 (SAN), Shang Lian, *Sumbing* SAN 110166 (SAN); Beluran, Bk. Luminitung, *Aban Gibot* SAN 94482 (SAN,K,L); Kalabakan, Ulu Sg. Kalabakan, *Fedilis* SAN 103578 (SAN); Keningau, *Fedilis* SAN 119661 (K, SAN), *Francis et al.* SAN 10924 (K, SAN), Ulu Sg. Tinagalan FR., *Sumbing* SAN 113104 (SAN), Ulu Sg. Matud, *Fedilis* SAN 119586 (SAN), Lawas, *Fedilis* SAN 119661 (SAN), Pisagon, *Sumbing* SAN 128268 (SAN), Trusmadi-Sinua trail, *Meijer* SAN 122614 (SAN); Pandawan, Sg. Pemantarian, *Mantor* SAN 119987 (SAN); Tenom, Kalang FR., *Gambio et al.*, SAN 133697 (SAN); Mt. Kinabalu, *Burbidge* s.n. (K), *J & M S Clemens* 4876 (BM), *J & M S Clemens* 31517 (BM), *J. & M. S. Clemens* 31583 (BM, L; type of *P. gladiata*), *J & M S Clemens* 32099 (BM), *Creagh* s.n. (K), Penibukan, *J. & M. S. Clemens* 40651 (K); Beluran, Kuala Sg. Sasau, *Aban Gibot & Matin* SAN 69350 (SAN); Pensiangan, Pensiangan Kayu FR., *Fedilis* SAN 130102 (SAN); Ranau, Trusmadi FR., *Majawat* SAN 128756 (SAN); Telupid, Tawai FR., *Francis et al.* SAN 109624 (SAN); Pinangah, Sg. Melikop, *Leopold Madani & D. Sundaling* SAN 60237 (SAN), Ulu Sg. Melikop, *Dewol et al.* SAN 109330 (SAN), Pinangah FR., *Fedilis & Sumbing* SAN 110277 (SAN); Pitas, Paitan FR., *Amin & George* SAN 121337 (SAN); Sandakan, Labuk rd., *Dewol et al.* SAN 71200 (SAN), Sg. Ruku-ruku, *Aban Gibot* SAN 94034 (K, L, SAN), Sepilok FR, *Meijer* SAN 21239 (K, SAN), Kebun China, *Meijer* SAN 121131 (SAN), 111240 (SAN), *Meijer & Good* SAN 130940 (SAN); Kinabatangan, Tangkulap FR., *Majawat et al.* SAN 110036 (SAN). **SARAWAK:** s. loc., *Native Coll.* 1083 (BM), *Native Coll.* 1368 (BM); Kuching, *Hewitt* Series 217 (SAR), 168, 972, 1135, 1136, 1137, 1138 (SAR), *Haviland* 520 (K, SAR), *Haviland* 892 (SAR), *Anderson* 13 (K), *Ridley* s.n. (BM, K), *Yii* S. 45954 (K, KEP, L, SAR), *Zen* 13039 (K, SAR), Bako National Park, *P. Chai* S. 18015 (K, L, SAN), S. 19541 (K, SAR), Mt. Kubah NP, *R. Go* RG 411 (UKMB), Setapok FR, *Anderson* 9771 (L, SAR), Semenggoh FR, *Anderson* S. 25146 (SAR), Matang, *Ridley* 1923 (BM), *Ridley* 6013 (BM), Matang FR, *Yii* S. 45954 (SAR; SAR, SING), Mt. Matang, *Haviland* 1503 (K), Bungoh range, *Brunig* S. 9524 (SAR), *Anderson et al.* S. 29311 (K, KEP, L, SAR), Bk. Nibong, *Burtt & Woods* B. 4895 (SAR), s. loc., *Beccari* PB 1333 (K), G. Buri, *Ilias Paie* S. 44196 (K, KEP, L, SAN, SAR); Lundu, *Rena George* S. 41732 (SAR), G. Gading, *Ilias Paie* 13593 (K, L, SAR), *Mamit* S. 35129 (K, L, SAR); Serian, Balai, *A. Muas* 13470 (K, SAR); Mt. Ben Karum, *Brooks* s.n. (SAR); Bidi Caves, *Collenette* 741 (K, SAR); Miri, Bk. Lambir FR, *Dan Hj Bakar* 3028 (K, L, SAR), Bk. Lambir, *Banyeng & Sibat* S. 24479 (K, L, SAR), Lambir National Park, *Abg. Mohtar et al.* S. 47151 (SAR); Bintulu, Bk. Sekiwa, *Abg. Mohtar et al.* S. 51420 (SAR), Bk. Lumut, *Yii* S. 65983 (SAR); Bk. Alak, *Dayang Awa & I. Paie* S. 45656 (K, L, SAR); Bk. Buan, *Haviland* 2052 (K); Mt. Berengoh, *Haviland* 2008 (K, SAR); Gunung Raya, *Nooteboom* 1088 (L); Mardang, *Hewitt* Series 218 (SAR); Baram, *Hewitt* Series 734 (SAR), *Haviland & Hose* s.n. (K), *Haviland & Hose* 213 (K, L), 544 (K, L), *van Neil* 4267 (L), G. Api, *Anderson* S. 30870 (E, K, L, SAR), Mulu National Park, *Stone* 13570 (SAR), *Yii & Abu Talib* S. 58707 (SAR), Marudi FR, *Yacup* S. 8277 (K, SAR), Bk. Kelabi, *Ilias Paie* S. 22945 (K, L, SAN, SAR, SING), Bk. Kelabi, *Ilias Paie* S. 22945 (SAR); Limbang, Tg. Long Amok, *Rena George et al.* S. 42374 (K, L, SAR); Lawas, *B. Lee* S. 52406 (SAR); Semuan

Wildlife Sanctuary, *Abg. Mohtar & Othman* S. 52653 (SAR); Balleh, *Ilias Paie* S. 19866 (K, L, SAR); Sg. Tau, *Purseglove* P. 5128 (K, L. SAR); Ulu Mayeng, Kakus, *Sibat* S. 21829 (BO, K, KEP, L, SAN, SAR, SING).

In general appearance, this species is similar to *P. beccariana* but differs in having pedicellate flowers on the margin of the inflorescence. This is the most widely distributed species in the genus and shows the greatest range of variation in the shape and size of leaves and inflorescence.

9. *P. quinquefoliolata* Merrill, Calif. Publ. Bot. 15 (1929) 181; Suessenguth in Engler & Prantl, Natur. Pflanzenfam. 20d (1953) 317; Latiff, Fedn. Mus. J. n.s. 27 (1982) 63.

DISTRIBUTION. Known only from Sabah and Brunei.

SPECIMENS EXAMINED—BRUNEI: Belait, Sg. Liang, *Wong* WKM 1 (BRUN, SAN). **SABAH:** Sandakan, Telupid, *Aban Gibot & Saikeh* SAN 79331 (SAN); Pensiangan, Ponontomon, *Fedilis* SAN 127924 (SAN); Nabawan, Sepulut, *Dewol & Lideh* SAN 124723 (SAN), Sg. Millian, *Mantor* SAN 118562 (SAN), *Sumbing* SAN 118759 (SAN); Sepulut, Sg. Setiawan, *Fedilis* SAN 113403 (SAN); Keningau, Ulu Sg. Matud, *Fedilis* SAN 119588 (SAN), Pisagon, *Fedilis* SAN 128255 (K, SAN); Pandawan, Sg. Pamantarian, *Fedilis* SAN 120071 (SAN), Bombalai FR, *Binson & Yunus* SAN 62777 (SAN), Lamag, Kg. Karamuak, *Leopold Madani* SAN 81596 (SAN), SAN 91692 (SAN); Beluran, Telupid, *D. Sundaling* SAN 91074 (SAN); Kalabakan, km. 25, *Sumbing* SAN 101457 (SAN); Tawau, *Dewol Sundaling* SAN 91074 (K, L, SAN, SAR), *Elmer* 27104 (holotype K, isotypes BM, L), Ulu Balong, *Meijer* SAN 28693 (SAN), Kinabutan Kecil, *Aban Gibot* 35886 (K, SAN), Balong, *Aban Gibot* SAN 32402 (K, L, SAN), Tawau hills, *Aban Gibot & F Minjulu* SAN 79665 (K, KEP, L, SAN, SAR), *Wong* WKM 2118 (SAN), *Kokawa & Hotta* 475 (L), *Leopold Madani* SAN 81595 (K, SAN), *Leopold Madani* SAN 91692 (K, L, SAN, SAR), *Latiff & Hamid* ALM 3311 (UKMB), *Fedilis & Sumbing* SAN 88218 (K, L, SAN); Apau road, *Fedilis* SAN 86668 (K, L, SAN), Luasong, *Fedilis* SAN 87312 (K, L, SAN, SAR), *Fedilis & Sumbing* SAN 89708 (K, KEP, L, SAN, SAR), *Fedilis & Sumbing* SAN 95663 (L, SAN), *Fedilis* SAN 95617 (K, KEP, L, SAN, SAR, SING), *Fedilis* SAN 95880 (K, L, SAN), *Fedilis* SAN 119699 (K, SAN), Ulu Sg. Luasong, *Fedilis & Matin* SAN 68760 (K, SAN), Hap Seng, *Fedilis & Sumbing* SAN 89117 (K, SAN).

Generally the leaves are digitate and always 5-foliolate but specimens with trifoliolate leaves have been observed too. As far as is known, this species is confined to the Pensiangan and Tawau area of Sabah.

10. *P. rufula* (Miq.) Planchon in DC., Monog. Phan. 5 (1887) 419; Ridley, Fl. Mal. Penin. 1 (1922) 482 *pro parte*; Suessenguth in Engler & Prantl, Natur. Pflanzenfam. 20d (1953) 318; Latiff, Fedn. Mus. J. n.s. 27 (1982) 59.

P. taeniata Planchon in DC., Monog. Phan. 5 (1887) 419.

DISTRIBUTION. Borneo (Brunei, Sarawak and Kalimantan), Sumatra and the Malay Peninsula.

SPECIMENS EXAMINED—BRUNEI: Belait, Sg. Liang, *Forman* 1089 (K), *Wong* WKM 126 (BRUN, SAR). **KALIMANTAN:** Njarumpoh, *Elsener* 18 (K,L); Gunung Raya, *Church et al.* 481 (BO). **SARAWAK:** s. loc., *Beccari* 2264 (K, type of *P. taeniata*); Sg. Sadok, *Ilias Paie & Manggi* S. 45013 (K, SAR); Lundu, Kg. Keranji, *Burtt & Woods* B. 2739 (SAR); Bintulu, Bk. Kana, *Yii et al.* S. 67049 (SAR).

Planchon described *P. taeniata* from a single specimen (*Beccari* 2264) from Sarawak based on its tapeworm-like inflorescence. In my opinion its inflorescence is no different from that of other specimens of *P. rufula* and there are no good characters to distinguish them.

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REFERENCES

Blume, C. L. (1825) *Bijdragen tot de flora van Nederlandsch Indie* 1: 180–191. Batavia.

King, G. (1896) Ampelidaceae. *Materials for the flora of the Malay Peninsula. Disciflorae*. Royal Botanic Garden, Calcutta.

Latiff, A. (1982) Studies in Malesian Vitaceae. I. A revision of the genus *Pterisanthes* Bl. *Fedn. Mus. J. n. s.* 27: 42–69.

——— (1994) Inflorescence structure and evolution in the family Vitaceae. *Malays. Appl. Biol.* 23 (1 & 2): 11–22.

——— (1996) Vitaceae. *Flora Malesiana* (mimeo, unpublished).

Lawson, M.A. (1875) Ampelidaceae. In: J. D. Hooker, *Flora of British India* 1: 644–664. Reeve & Co., London.

Miquel, F.A.G. (1860–1861) Ampelideae. *Flora van Nederlandsch Indie*, Suppl. 1: 201–202 & 514–518, Suppl. 2: 600–608. Van der Post, Utrecht.

——— (1862–1863) Ampelideae novae. *Ann. Mus. Bot. Lugd.-Bat.* 1: 72–101.

Planchon, J. E. (1887) Monographie des Ampelidees vraires. In: A. de Candolle, *Monographie Phanerogamarum* 5, 2: 306–654. Sumptibus G. Mason, Paris.

Ridley, H. N. (1922) Ampelidaceae. *Flora of the Malay Peninsula* 1: 469–482. Reeve & Co., London.
——— (1931) Additions to the flora of Borneo. III. *Kew Bull.* 493–499. Pp. 496–497.

Suessenguth, C. (1953) Vitaceae. In: A. Engler & K. Prantl. *Die naturlichen Pflanzenfamilien* 20d: 235–329. Dunker & Humblot, Berlin.

Steenis, C.G.G.J. van & Bakhuizen van Den Brink, R.C. (1967) Miscellaneous botanical notes XVI. 104: Two new Bornean *Pterisanthes* (Vitaceae). *Engler's Bot. Jahrb.* 86: 385–390.